

CLAIMS

1. A chuck for use with a manual or a powered driver having a rotatable drive shaft, the chuck for selectively gripping a tool shank, and comprising:

a central body having a tail section and a nose section, the central body defining an axis of rotation;

the tail section having an axial bore formed therein, along the axis of rotation, the tail section for coupling the chuck with a driver presented thereto;

the nose section having a plurality of passageways formed therein, each passageway of the plurality of passageways defining an axis which is angled with respect to the axis of rotation of the central body;

a plurality of jaws, each jaw of the plurality of jaws slidably housed within a respective one of the plurality of passageways, and wherein each of the jaws of the plurality of jaws carries a thread and a jaw face formed on a side of the jaw opposite the thread;

a nut mounted on the central body and being rotatable about the central body, but axially immovable relative to the central body, the nut carrying a screw thread for mating engagement with the threads of each of the jaws of the plurality of jaws, such that rotation of the nut causes concomitant slidable movement of each jaw of the plurality of jaws within its respective passageway, thereby to advance each jaw within its respective passageway when the nut is rotated in one sense about the axis of rotation, and to retract each jaw within its respective passageway when the nut is rotated in the opposite sense of rotation about the axis of rotation;

at least one bearing member disposed intermediate the nut and the central body; characterised in that between the nut and the central body a part-conical surface is formed, along which part-conical surface the at least one bearing member may travel as the nut is rotated relative to the central body, and along which part-conical surface the at least one bearing member may be displaced radially with respect to the axis of rotation of the central body under action of at least a predetermined amount of force acting upon the at least one bearing member such that the displacement of the bearing member results in frictional engagement between the bearing member and a portion of the chuck which is non-rotatable relative to the central body, thereby to restrain the nut from rotation in the opposite sense under action of less than the predetermined force.

2. A chuck according to claim 1 wherein the part-conical surface is formed by a surface of the nut which contacts the at least one bearing member and which surface of the nut is arranged to be not perpendicular to the axis of rotation of the central body.
3. A chuck according to claim 1 wherein the part-conical surface is formed by a surface of the central body which contacts the at least one bearing member and which surface of the central body is arranged to be not perpendicular to the axis of rotation of the central body.
4. A chuck according to claim 1 wherein the central body has formed thereon a thrust plate, against which thrust plate the at least one bearing member is able to rotate under influence of rotation of the nut.
5. A chuck according to claim 4 wherein the surface of thrust plate against which the at least one bearing member rotates is not perpendicular to the axis of rotation of the central body.
6. A chuck according to claim 1 wherein the at least one bearing member comprises a resiliently deformable ring.
7. A chuck according to claim 1 wherein the at least one bearing member comprises a plurality of radially moveable or expandable elements.
8. A chuck according to claim 1 wherein the at least one bearing member comprises a plurality of bearing elements pivotable about a pivot point.
9. A chuck according to claim 8 wherein the pivot point is formed at one end of each element of the plurality of bearing elements.
10. A chuck according to claim 1 wherein a solid line of rotation about the surface of the nut which contacts the at least one bearing member forms a cone or a frusto-conical surface.
11. A chuck according to claim 1 wherein a solid line of rotation about the surface of the central body which contacts the at least one bearing member forms a cone or a frusto-conical surface.

12. A chuck according to claim 5 wherein a solid line of rotation about the surface of the thrust plate which contacts the at least one bearing member forms a cone or a frusto-conical surface.
13. A chuck according to claim 1 wherein the nut and the central body between them form the part-conical surface.
14. A chuck according to claim 4 wherein the thrust plate and the central body between them form the part-conical surface.
15. A chuck according to claim 1 wherein the bearing member includes a plurality of rolling members to reduce frictional contact between the bearing member and either of the nut or the central body.
16. A chuck according to claim 15 wherein the plurality of rolling members comprise bearing balls.
17. A chuck according to claim 15 wherein the plurality of rolling members comprise cylindrical needle bearings.
18. A chuck according to claim 17 wherein the plurality of rolling members comprise tapered needle bearings.